14014702-3 Artificial Neural Networks

Mid-term Exam

Total Marks: 30 **Dated: 15-03-2021**

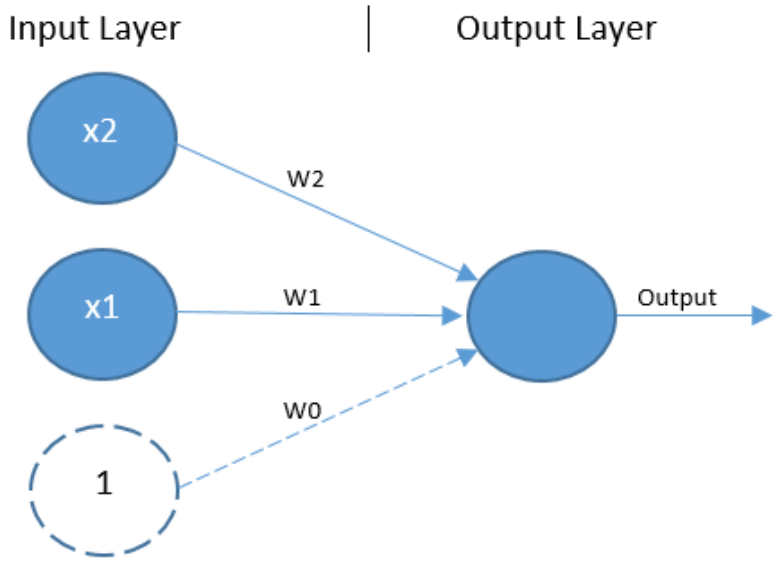
Time: Two hours

Question 1: **10 Marks**

(a) What is the meaning of linearly separable classes and linearly non-separable classes?. Show one example
(b) Why can a single-layer perceptron not classify the classes that are not linearly separable?
(c) What is the advantage of the Adaline neural network over single-layer perceptron?
(d) Why can a single-layer perceptron not classify the classes that are not linearly separable?
(e) Prove the delta learning rule for Adaline Neural Network.

Question 2: **10 Marks**

For the following data, Calculate the weight update for one epoch for an Adaline Neural Network



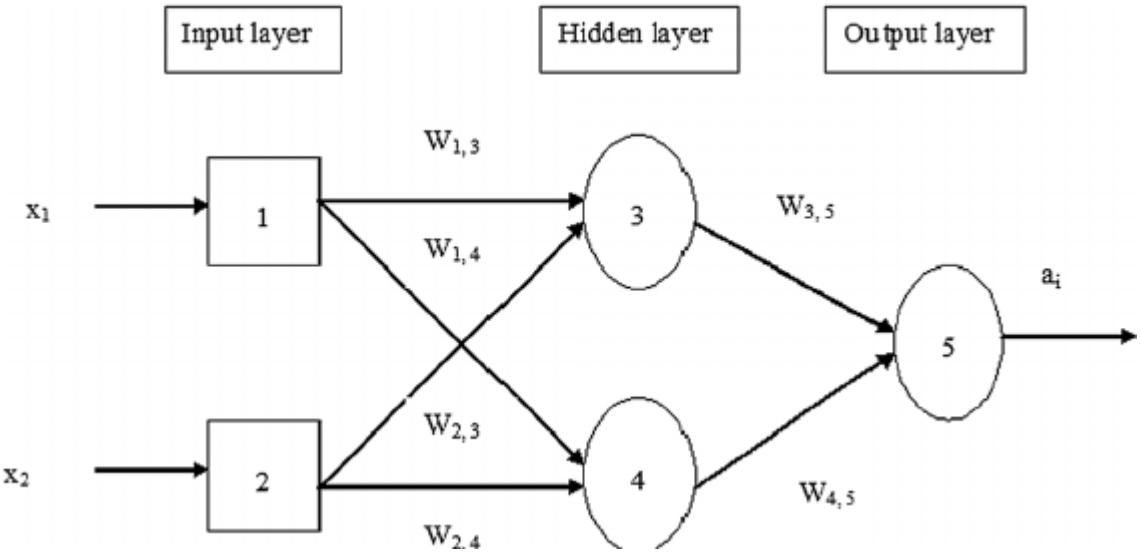
Input-output Data is

X0	X1	X2	d (Output)
+1	+1	-1	+1
+1	-1	-1	-1
+1	-1	+1	-1

Initial Weights are W = [0 0 0] and learning rate is 0.5.

Question 3: **10 Marks**

Consider a back-propagation feedforward neural network with two inputs. It has two hidden neurons and one output neuron.



Input-output Data is

X1	X2	d (Output)
+1	-1	+1
-1	+1	+1
-1	-1	-1

Initial Weights are W = [0 0 0 0.1 0.1 0.1] and learning rate is 0.1.